
METHOD OF TEST
CONTRACTION JOINT SEAL PERFORMANCE BY VACUUM TEST METHOD
BY THE IOWA VACUUM JOINT SEAL TESTER (IA-VAC) METHOD

SCOPE

This test method describes the procedure for determining the performance of contraction joint seals by applying a vacuum above the seal and observing for air bubbles which indicate seal leakage between pavement slabs or bridge deck sections.

PROCEDURE

A. Apparatus

1. IA-VAC Chamber
150 mm (6 in.) x 1220 mm (48 in.) x 50 mm (2 in.)
2. Vacuum Pump
Fisher, 246 watt (0.33 hp) 128 L (4.0 ft³)/min. airflow
3. Vacuum Reserve Tank
14 L (0.5 ft³)
4. Vacuum Hoses
1 - 6 mm (0.25 in.) x 3 m (10 ft.)
1 - 6 mm (0.25 in.) x 1 m (3 ft.)
5. Sprayer
12 L (3 gallon) with shampoo/water solution
6. Portable electric generator
Honda, 1400 watt (1.9 hp)
7. Two pieces of impermeable foam or strip seal shaped to block the openings above the joint seal at each end of the IA-VAC chamber

B. Test Procedure

1. Select the test location at random or as best suited for general coverage evaluation.
2. Spray-wet the road surface area to be covered by the test chamber and double spray over the sealed joint with the water/shampoo solution.
3. If the joint seal is more than 3 mm ($\frac{1}{8}$ in.) lower than the road surface, place a short piece of impermeable foam or strip seal, in the joint under each end of the chamber to assist in chamber sealing.

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4. Place the test chamber over the joint and press it onto the road surface by having the operator stand on it (until a vacuum indication is observed).
 5. With the chamber vacuum release valve closed, open the vacuum line valve to create a vacuum inside the chamber. Watch for a vacuum indication on the test chamber vacuum gauge and control it at maximum 10 kPa (3 in. Hg) during the test. As soon as a vacuum indication is observed, the operator can step off the chamber.
 6. Observe and record:
 - a. Test location
Station/bridge/lane/joint/distance from centerline
 - b. Vacuum reading
kPa (in. of Hg)
 - c. Number of leaks
Seal leakage is considered significant when individual bubbles or bubble clusters form rapidly. Count and record the number of locations in the test length where significant bubbles or bubble clusters appear.
 - d. Cause of leak
Cause to be determined by inspection after the test chamber is removed from the joint. (See Note.)
 7. Close vacuum line valve. Open vacuum release valve.

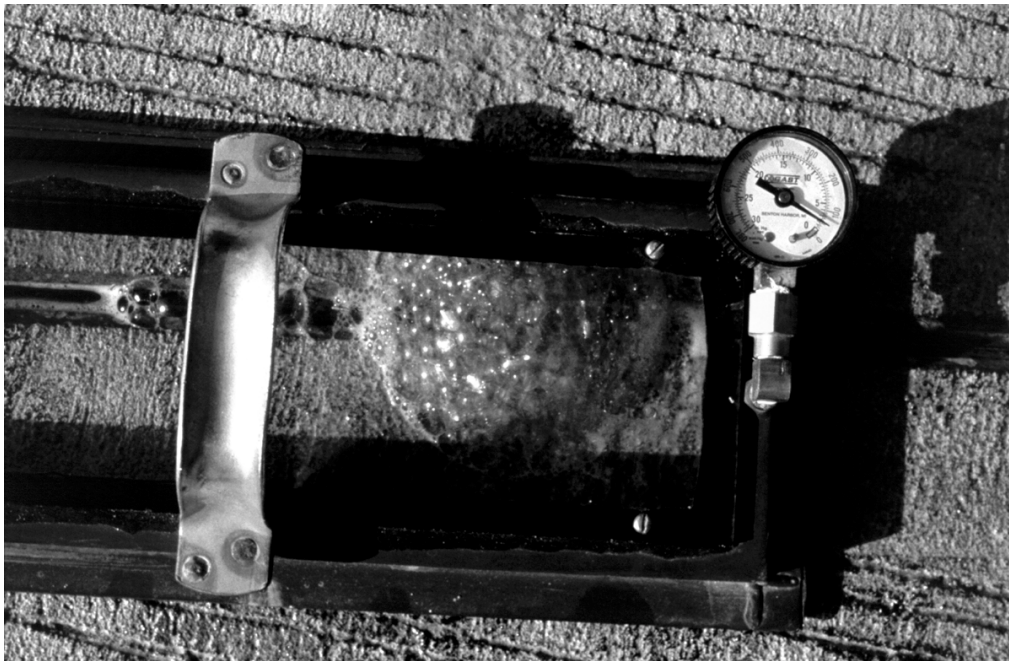
NOTE: The most common causes of joint seal leakage are:

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|-----------------------|-------------------------|
| 1. Adhesion failure | 5. Insufficient sealant |
| 2. Concrete spall | 6. Cohesion failure |
| 3. Sealant bubble | 7. Other |
| 4. Unclean joint face | |

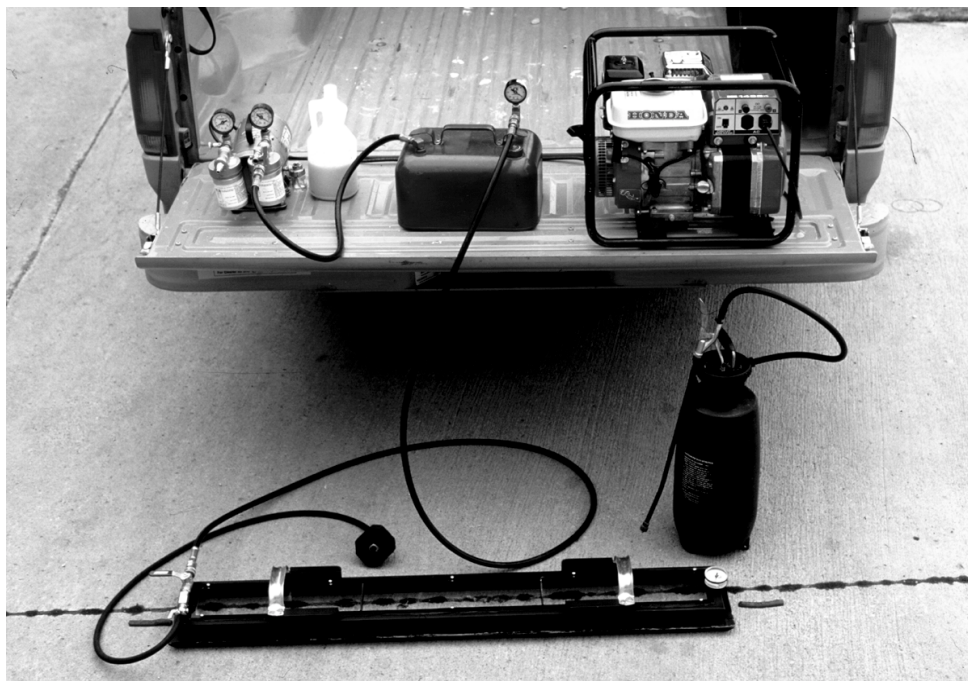
Joint Seal Performance by Vacuum Test Method
Data Sheet

Highway - _____ County - _____
Bridge - _____ Contractor - _____
Date Sealed - _____ Sealant - _____
Date Tested - _____ Mile Post - _____

Test No.	Station MP	Lane	Joint	Off CL Ft. Dir.	Vacuum in./Hg	No. of Leaks	Cause of Failure			
							Adhesion	Spall	Bubble	Other
EX	1100+20	NB, Dr	1	3, E	3	2	1	1	----	----
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										



IA-VAC Chamber with Bubble Cluster



Pickup with IA-VAC Chamber and Accessories